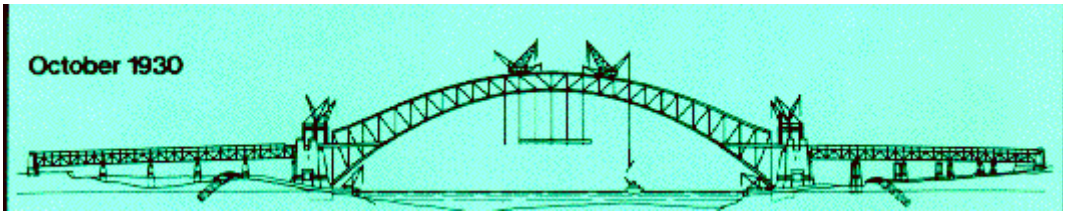
Mathematics For Queensland
Year 11 Mathematics B
Chapter Two – Quadratic Functions

The Sydney Harbour Bridge



The Sydney Harbour Bridge under construction

The arches of the Sydney Harbour Bridge can be accurately modelled as two parabolas.

Dr. Mark Stewart from the Department of Civil, Surveying and Environmental Engineering, The University of Newcastle supplied the following information about these arches:

> "The only information I have is 3 points for each arch (supports and top measurements). The reference point (0,0) is the bottom of the lower arch, left side.
>
> Bottom arch: known points in (x,y) are (0,0), (251.5,118),(503,0) in metres.
> Top arch: known points in (x,y) are (0,59),(251.5,136),(503,59) in metres."

From the information supplied by Dr. Stewart, find the equations of the two arches of the Sydney Harbour Bridge. Check your answer by plotting the equations.